

REMARKS/ARGUMENTS

1. Summary of Office Action

In the Office action mailed April 13, 2004, the Examiner rejected claims 1-2, 5-6, 12-17, and 23-26 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 5,943,604 (Chen et al.). The Examiner rejected claim 7 under 35 U.S.C. §103(a) as being unpatentable over Chen et al. The Examiner rejected claims 3 and 4 under 35 U.S.C. §103(a) as being unpatentable over Chen et al. in view of U.S. Patent No. 6,137,793 (Gorman et al.). And the Examiner rejected claims 8 and 9 under 35 U.S.C. §103(a) as being unpatentable over Chen et al. in view of U.S. Patent No. 5,400,322 (Hunt et al.).

The Examiner also objected to claims 10-11 and 18-22 as being dependent upon a rejected base claim, but indicated that claims 10-11 and 18-22 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

2. Response to Examiner's Objections

Applicant thanks the Examiner for pointing out the claims towards Applicant's invention which are allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. In this regard:

- Applicant has amended claim 1 to include all of the limitations of original claim 18.
- Applicant has added new independent claim 28, which incorporates the elements of original claims 1 and 19. Applicant has added new dependent claims 29-35, which are dependent on claim 28.
- Applicant has added new independent claim 36, which incorporates the elements of original claims 1 and 21. Applicant has added new dependent claims 37-43, which are dependent on claim 36.

- Applicant has added new independent claim 44, which incorporates the elements of original claims 1 and 10. Applicant has added new dependent claim 45 which is dependent on claim 44.

New dependent claim 29 is similar to original claim 20. New dependent claim 37 is similar to original claim 22. New dependent claims 30 and 38 are similar to original claim 4. New dependent claims 32 and 40 are similar to original claim 6. New dependent claims 30 and 38 are similar to original claim 8. New dependent claims 33 and 41 are similar to original claim 12. New dependent claims 34 and 42 are similar to original claim 13. And new dependent claims 35 and 43 are similar to original claim 17.

Applicant has amended the claims as indicated by the Examiner and submits that independent claims 1, 28, 36, and 44 are now in condition for allowance. Further, because each of claims 2-7, 12-17, 29-35, 37-43, and 45 depend from either claim 1, 28, 36 or 44, Applicant submits that claims 2-7, 12-17, 29-35, 37-43, and 45 are also in condition for allowance.

3. Other Amendments and Pending Claims

Applicant has amended claim 23 to include elements from original claim 25. The amendment to claim 23 is supported by the specification at page 29, lines 7-15. Applicant has added new claim 27, which is supported in the specification at page 18. Applicant has cancelled claims 8-11, 18-22, and 25. Now pending in this application are claims 1-7, 12-17, 23-24, and 26-45 of which claims 1, 23, 28, 36, and 45 are independent and the remainder are dependent.

4. Response to Applicant's Obligation under 37 C.F.R. §1.56

The Examiner stated "this application currently names joint inventors" and advised the Applicant of the obligation under 37 C.F.R. §1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. §103(c) and potential 35 U.S.C. §102(e), (f), or (g) prior art under 35 U.S.C. §103(a). The Applicant submits that this application names only a single inventor.

5. Response to §102 Rejections

As noted above, the Examiner rejected claims 1-2, 5-6, 12-17, and 23-26 under 35 U.S.C. §102(e) as being anticipated by Chen et al. As noted above, the Applicant has amended claim 1 to include all of the limitations of claim 18, which was objected to by the Examiner. Applicant submits that claim 1 is now in condition for allowance and that the rejection to claims 1-2, 5-6, and 12-17 is moot.

The Applicant respectfully traverses the anticipation rejection of pending claims 23, 24, and 26 because Chen et al. as set forth below.

a. The Chen et al. Reference

Chen et al. discloses a method of determining a transmission frequency for an upstream path to a cable modem termination system (CMTS). The CMTS includes a packet generator for sending test packets to an echo device and a packet checker for receiving test packets sent by the echo device. Determining the transmission frequency involves checking noise in the system during a wait state. The packet generator does not transmit test packets during the wait state. If there is too much noise in the system, the packet generator begins sending test packets to the echo device and the packet checker begins receiving test packets from the echo device. The

packet checker performs an error analysis using the number of lost packets and the number of errored packets received and then saves error statistics for use in identifying a transmission frequency.

b. The Claimed Invention

The present invention pertains to optimizing data throughput at a target packet error ratio on an upstream channel that provides data transmissions from a plurality of cable modems to a cable modem termination system. The present invention provides methods for optimizing data throughput in a data-over-cable system.

In particular, independent claim 23 recites a method that includes selecting parameters for data transmission on the upstream channel, where the selection of parameters is based on a signal-to-noise ratio and a target packet error ratio. Applicant submits that Chen et al. does not disclose or suggest selecting parameters for data transmission based on a target packet error ratio. Although Chen et al. conducts an error analysis using a number of lost packets never received, the number of errored packets received, and the total number of packets received, these statistics used by Chen et al. do not equate to a *target* packet error ratio, which indicates a desired level of performance, and not a mere measure of actual performance. (See e.g., Chen et al., Column 11, lines 9-12). Similarly, Chen et al. does not disclose using a target packet error ratio to select data transmission parameters, which is also an element of claim 23. Nor does Chen et al. disclose that the data transmission parameters selected from a table comprise at least a symbol rate, modulation type, or error correction level.

Independent claim 23 also includes the limitations of scheduling a plurality of quiescent periods on the upstream channel wherein no data is transmitted by the cable modems on the upstream channel, and measuring a noise floor value on the upstream channel during at least one

of the quiescent periods. In rejecting claim 23, the Examiner asserted that the claimed scheduling of a plurality of quiescent periods and measuring of a noise floor value during a quiescent period is disclosed by a noise level check in the cable system during a wait state. The Examiner cited Chen et al. Column 10, lines 21-48, in support.

Applicant submits that Chen et al. does not disclose or suggest scheduling a plurality of quiescent periods on the upstream channel, nor measuring a noise floor value on an upstream channel during a quiescent period, where no data is transmitted by the cable modems on the upstream channel, as claimed in claim 23. Instead, Chen et al. discloses merely that a system checks the noise level in a wait state. Chen et al. repeatedly describes the process of measuring signal-to-noise ratio to be based on packet statistics and by repeatedly altering the transmission power levels. (See e.g. (i) “the noise level is determined by examining the number of errors in the test data and calculating the signal-to-noise ratio for the test frequency”, Chen et al., Column 7, lines 7-9, (ii) “Note that the power level is initially set to a high level and then decremented (at the selected frequency) to determine the carrier-to-noise ratio.”, Chen et al., Column 10, lines 54-56, and (iii) “in step 620 the power level is decremented by the amount set in step 604 and the system returns to step 608 where the system reinitializes the packet generator and checker for the new power level. The system then repeats steps 610 to 618 as described. If the lowest power level has been reached the system calculates the signal-to-noise ratio for the present frequency in a step 622.”, Chen et al., Column 11, lines 20-26). While the packet generator of the CTMS does not transmit during the wait state, this is not the same as a quiescent period where no data is being transmitted by cable modems on an upstream channel, as claimed by the Applicant in claim 23.

Furthermore, even if a wait state is deemed to be a quiescent period (which the Applicant does not concede), Chen et. al does not disclose the scheduling of a plurality of wait states or even scheduling a single wait state. Instead, Chen et al. discloses that if the noise level is acceptable, the system is in a wait state and continues to check the signal-to-noise level of the transmissions. (Chen et al., Column 10, lines 33-35). Merely being in a wait state when a noise level is acceptable does not equate to scheduling a quiescent period as claimed by the Applicant.

Because Chen et al. does not teach or suggest each and every element of claim 23, Chen et al. fails to anticipate claim 23 under 35 U.S.C. § 102(e). Further, because each of claims 24 and 26 depend from claim 23, Chen et al. necessarily also fails to anticipate claims 24 and 26 as well.

5. Response to §103 Rejections

As noted above, the Examiner rejected claim 7 under 35 U.S.C. §103(a) as being unpatentable over Chen et al. The Examiner rejected claims 3 and 4 under 35 U.S.C. §103(a) as being unpatentable over Chen et al. in view of Gorman et al. And the Examiner rejected claims 8 and 9 under 35 U.S.C. §103(a) as being unpatentable over Chen et al. in view of Hunt et al.

Also, as noted above, the Applicant has amended claim 1 to include all of the limitations of claim 18, which was objected to by the Examiner. Applicant submits that claim 1 is now in condition for allowance. Since claims 3, 4, and 7 are dependent on claim 1 and since claims 8 and 9 were cancelled, the Examiner's rejection to claims 3, 4, and 7-9 is moot.

6. Conclusion

In view of the above amendments, remarks and arguments, the Applicant respectfully submits that claims 1-7, 12-17, 23-24, and 26-45 are now in a condition for allowance, and respectfully request favorable reconsideration and allowance of the claims. If the Examiner would like to discuss this case, the Examiner is welcomed to contact the undersigned at (312) 913-3305.

Respectfully submitted,

Date:

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